Report of Interview Findings:

Initial Broadband Development and Utilization Assessment for Wisconsin

June 23, 2010

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Overview

Wisconsin's Public Service Commission (PSC) received on behalf of the State of Wisconsin, a Broadband Mapping and Planning Grant from the federal National Telecommunications and Information Administration[1] (NTIA). This grant is to provide a comprehensive assessment of the current availability, adoption and use of broadband communications throughout the state. It will also identify specific strategies to fill current gaps in broadband access and develop a "business plan" to expand the adoption of deployed broadband and expedite the achievement of priority goals in the areas of education, health care, economic opportunity, energy management, environmental quality, governmental effectiveness, civic engagement and public safety, as well as improving the quality of life.

Stakeholders Interviewed

Education
- University outreach faculty
- University administrator
- K-12 distance educ. specialist
- Teacher association leader

Health Care
- Hospital telehealth specialist
- Bio-technology leader

Economic Opportunity
- Dairy farmer
- Agricultural coop director
- Technology organization director
- Trucking firm representative
- Tribal econ. development
- Media business owner

Energy and Environment
- Energy utility leader
- Green energy entrepreneur

Government
- State officials (2)
- State regulatory leaders (2)
- County supervisor

Civic Engagement
- Statewide nonprofit director
- Community nonprofit director
- Faith-based and community partnership leader

Public Safety
- Homeland security leader
- Emergency management leader

Broadband Service Providers
- Large telco representative
- Smaller company telco manager
- Cable company representative

Interview Process

The Mapping and Planning Grant includes comprehensive work on assessing broadband demand and on planning for greater awareness and use. In that regard, the project will include a situational analysis; will include research on broadband uses and barriers to adoption; and will encompass the facilitation of broadband technology planning teams to develop further broadband access strategies. As an initial step in this process, a series of 28 individual interviews was conducted. The interviewees were chosen to be representative of the key stakeholders in each area of targeted impact (see sidebar to the right). In choosing whom to interview, the research team was careful to include people living in all regions of the state.

Each person interviewed was engaged in an interview process to discover the different stakeholder perspectives and personal visions for Wisconsin's broadband development and use. In addition, each person interviewed was asked to identify recommended actions that would make their vision for Wisconsin

[1] A brief summary of Wisconsin's NTIA grant appears is provided in Appendix A

broadband development more likely to become a reality. The results from these 28 interviews are summarized in this document. Specifically, the interviewees were asked to describe broadband development outcomes and actions they consider to be both possible and highly desirable for Wisconsin by 2015.

Purpose of Report

This report presents the findings from interviews of key stakeholders from around Wisconsin. These results lay the groundwork for a series of regional planning efforts designed to increase the availability and adoption of broadband throughout the state.[2] This report is used to frame two subsequent data collection efforts: 1) a consumer survey investigating broadband usage, and 2) an interactive web survey designed to raise awareness and to identify region-specific priorities for broadband. Together, these research findings will be combined with the outcomes of the mapping process and applied into strategic actions by regional planning teams. These efforts will be accomplished in close coordination with on-going Wisconsin regional broadband planning initiatives.

Context

It is important to emphasize that findings presented in this summary report reflect the diverse perspectives of key Wisconsin stakeholders participating in the interview process. The findings are not intended to be statements of consensus. Rather, this report represents a broad perspective on what is considered by the 28 people interviewed as both possible and desirable for the future of broadband deployment and use in Wisconsin as it unfolds over the next five years.

Wisconsin's Broadband Readiness

Broadband[3] Infrastructure

While all of the urban areas and most of the suburban areas of the state have access to one or more broadband service providers, there are still a significant number of rural Wisconsin communities, including Tribal areas that do not have access to any broadband services. Commonly described reasons for these gaps include the high cost of deployment and the low prospect of return on investment. However, multiple stakeholders interviewed identified the following Wisconsin assets as building blocks that provide reason for optimism that broadband infrastructure and service availability will improve over the next five years. Several ventured that by 2015, it is likely that 90 to 95 percent of Wisconsin households will have access to at least one provider offering a high-speed Internet connection with service in the range of 3 Mbps. to 5 Mbps.

- BadgerNet has already established high-speed transport connections to most school districts and many governmental institutions.

[2] Appendix B provides an overview of the planning steps.
[3] A definition of broadband as the term is used in this report is provided in Appendix C.

- WiscNet provides a not-for-profit network connecting higher education institutions throughout the state, as well as additional connections to schools and public institutions.[4]

- Wisconsin has among the largest number of broadband service providers in the nation.[5]

- Smaller telephone companies and cooperatives in the state have substantially built out broadband infrastructure in areas they serve.

- Wisconsin has an already established base of emerging entrepreneurial broadband service providers.

- Fixed wireless and mobile service towers have become increasingly available for broadband build out, even in rural areas.

Broadband Adoption

Where broadband services are available, Wisconsin residents, businesses, non-profits and governmental entities of all types have made use of broadband. However, there are many opportunities to increase adoption (usage) of broadband where it is currently available – and this report highlights several ideas in the "Possible Actions" section below. The 28 stakeholders interviewed as a part of the initial assessment all recognized the importance of expanding interest in broadband among non-users. Several key trends and assets were frequently recognized as important to Wisconsin's success in expanding broadband adoption among current non-users over the next five years.

- Federal priorities in health care, education, governmental performance and public safety can provide an important source of funding to help connect the remaining hospitals, schools, government buildings and public safety facilities over the next several years.[6]

- Wisconsin governmental leadership has given priority to the expansion of BadgerNet and WiscNet systems creating the potential of broadband reaching all schools and other public institutions, such as hospitals in Wisconsin's communities, over the next five years.

- Kiosks and other public computer access locations (such as libraries, schools, churches and community centers) can potentially be expanded to enable broadband access opportunities for those without computers at home, especially to low-income households in urban areas.

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[4] WiscNet does not provide transport.

[5] Appendix D includes a complete listing of Wisconsin broadband service providers. The number of service providers does not necessarily indicate additional choices of available service providers in a given community.

[6] Appendix E provides a list of recent federal broadband grants received by Wisconsin.

- Expanding consumer demand for broadband will result in more private sector incentive to extend broadband service to less populated communities and areas.

- Organized local action groups, such as Community Area Networks, have proven to be successful advocates for more deployment of broadband in unserved and underserved communities in Wisconsin. These same organizations will provide local leadership to address barriers to broadband adoption and use.

- Wisconsin already has several well established regional broadband development initiatives underway.

Priorities for Broadband Use

In March 2010, the Federal Communications Commission (FCC) responded to Congress' request for the development of a National Broadband Plan. The National Plan emphasized the importance of broadband access, adoption and use to achieve priorities in education, health care, economic opportunity, energy efficiency, environmental quality, government performance, civic participation and public safety. The 28 Wisconsin stakeholders interviewed also recognized these same themes as priorities for broadband adoption and use over the next five years. While the perspectives summarized below do not represent consensus of all stakeholders interviewed, they do represent a substantial range of broadband opportunities viewed as possible over the next five years.

Education

Most stakeholders interviewed noted Wisconsin has a long established priority to ensure all residents have access to a high quality education, including early childhood education, K-12, universities, technical colleges and continuing education. With wider availability and adoption of broadband within schools, businesses, public institutions and homes, there are more opportunities to expand educational and training access to Wisconsin's families, businesses and communities. Examples include:

- Access to specialized courses in science, technology, math, engineering, foreign language and other skills critical to Wisconsin's workforce and economic development can be expanded through distance education.

- Access to advanced placement courses online can enable students and their families to "jump-start" college education degrees and placement in their preferred higher education programs.

- Teachers can innovate and improve "time-on-task" of classroom education by integrating face-to-face and online learning approaches.

- The integration of face-to-face and online approaches can help enrich curriculum with critical 21st century workforce skills, such as learning research methods, analytical thinking and determining the veracity of information found on the Web.

- People living in rural and isolated communities can avoid expensive and risky travel by connecting to four-year and two-year degree, certificate and continuing education programs from their home.

- With more families connected to the Internet:
  - Schools can quickly issue alerts of inclement weather, early school closing and other time-sensitive information.
  - Teachers can communicate with parents and students regarding assignments, grades and other matters.
  - Students can access homework help and research problems independently.

- The University of Wisconsin Extension system can utilize the wider availability of broadband connectivity to expand outreach and engagement on critical issues important to Wisconsin communities.

- Tribal schools and colleges can utilize online learning to expand access to culturally relevant educational content.

- With better integration of online tools into school administration and use in the classroom, schools are better able to manage costs through shared teaching arrangements, reduced stress on classroom space, utilizing joint buying arrangements and improving back-office functions.

Health Care

Health care is vital to the state's population and the growth of economic opportunities in Wisconsin's communities. Rising health care costs and access to care challenges have served as a catalyst for both more governmental funding and industry innovation in the use of information technology. With better high speed connections to hospitals, clinics and the broader community, there are opportunities to improve access, as well as efficiency, in the delivery of health care.

- Wisconsin's health care sector can adopt broadband and medical records software to improve efficiencies in the sharing and management of patient data. As a result, service costs can be reduced, and doctors and clinicians can provide better care of patients in any location where services are needed.

- People can utilize broadband connectivity and specialized devices to monitor health symptoms (e.g. blood pressure, heart rhythm or glucose levels) from home and also use video conferencing from home to consult with doctors and health specialists.

- For people living in homebound or isolated situations, expanded broadband access can be utilized to obtain necessary health care consultation and diagnostic services locally, avoiding the cost and safety risks of traveling to larger medical centers.

- As a result of broadband connectivity being available throughout rural Wisconsin, physicians, clinicians and patients can receive critical training and up-to-date information vital to care for medical needs without incurring the cost of travel to urban centers.

- Governmental agencies, non-profits and private companies can expand delivery of online information content to the public with information on how to better manage their health through choices of diet, exercise, early detection and other means.

- Local physicians and clinicians can more effectively develop partnerships with schools, libraries, community centers and other local organizations to deliver health education.

- Health consumers with broadband access can search the Internet to be better informed of their options resulting in better choices regarding purchases of health care, nutritional food and other wellness services.

- Tribal health centers can provide culturally appropriate and accessible health care.

- Wisconsin's doctors can connect with patients and consult with specialized health care providers in any location in the world.

Energy and Environment

Wisconsin places high value on the protection of its environment and is aggressively positioning the state as a leader in the production and use of green technologies. This is in the broader context of national policy that emphasizes the need to take more actions to reduce carbon emissions and reduce the nation's dependence on foreign oil supplies. The expanded broadband communications can contribute significantly to both national and state goals in the efficient management of scarce energy resources, the growth of a green economy and the preservation of environmental quality.

- The wider availability of broadband can support statewide deployment of smart-grid technology. This technology can maximize the efficiency of generation and transport, as well as distribution and consumption of electrical energy within an integrated grid.

- Homeowners can monitor home electrical use with IP enabled devices and plan usage according to cost per hour of consumption for energy and money savings.

- Broadband can be an important tool to reduce carbon fuel use associated with automobile travel:

    - Commuter trips can be reduced through work-at-home.

- Business owners can monitor and manage many of their business functions off-site using broadband connections.

- People living in isolated communities can reduce the number of trips required for medical appointments, school, shopping and other purposes.

- Second homeowners can utilize broadband to monitor and manage their properties, eliminating the number of trips for those purposes.

- Widely available mobile broadband can help reduce carbon fuel use associated with trucking transport through enabling information technologies to reduce time at loading docks, to monitor engine efficiency, avoid traffic congestion and so forth.

- Broadband can enable the effective use of GIS and GPS to manage tribal lands, public lands and environmentally sensitive resources.

- Expanded access to information technologies can lead to greater consumer awareness of where their electricity comes from and help drive demand for green products and renewable energy.

Government Performance & Citizen Engagement

Broadband creates an opportunity for government (including state, local and tribal governments) to improve performance and efficiency in serving the needs of Wisconsin residents. Also, broadband provides more opportunities for citizens and businesses to effectively engage and contribute to public decision-making.

- State agencies can utilize video-conferencing to reduce the need to travel and thereby make more efficient the use of public resources.

- Wisconsin state, local and tribal government can use broadband for innovation in many areas such as training, effective communication, leadership and strategic hiring.

- The cost of administering state programs can be reduced through online delivery of program services reducing the need to maintain local offices and mailing.

- Local governments including tribal governments can tap broadband for purposes ranging from the better sharing of plat maps with real estate developers to the remote monitoring of public infrastructure such as sewer and water facilities.

- The wider availability of broadband can result in the more use of electronic medical records and the expanded use of telemedicine within state facilities, including the Department of Corrections.

- Through improvements of the state's information infrastructure, there can be improved governmental ability to coordinate, manage and warehouse public data.

- The ability of people to access and utilize broadband communications can enable citizens, non-profits and businesses to more effectively (and more widely) connect with individuals that have a shared interest in public issues.

- Broadband can be utilized by tribal gaming facilities to connect more efficiently with gaming control agencies in Madison.

- Broadband telecommunications can be adopted to facilitate social networking and support help programs for tribal communities. For example, networks can be expanded with non-profits in the delivery of community programs such as elder care, nutritional education and alcohol rehabilitation.

- Expanding the ability to utilize GIS and GPS technologies can help manage land and water resources.

- Governmental adoption of broadband enabled technologies such as smart toll systems, weigh-in-motion, digital logs can help improve competitiveness of Wisconsin's trucking sector.

- Government can be more effective in getting information out to the public using broadband media and the Internet

Public Safety

Public safety and security requires close coordination of many organizations across multiple jurisdictions. Depending on the type of event, an appropriate response could include the need for shared communication across fire, police, medical, Department of Natural Resources, State Patrol Federal law enforcement, and others. When a threat to safety or security becomes evident, it is often necessary to alert entire communities throughout a region. Emergency communication must be highly reliable and available.

- More widely available broadband services can enable the seamless sharing of data, video and voice among all emergency response and homeland security agencies.

- Emergency alert networks can be enhanced with police and emergency vehicles having real-time, live data access computer devices on-board. Examples include enhanced ability to:
  - Access visual data-bases and maps to locate and view approaches to houses.
  - Access critical patient medical records remotely from the field.
  - Transmit patient data and alert hospitals of incoming emergencies.
  - Share real-time information among multiple responders.
- Emergency alert networks (such as "Amber Alert" and "Code Red") can be more effective as the result of widely available broadband communications and especially the opportunity to issue alerts to cell phones.
- Data gathered by police stops and other law enforcement contacts can be more easily shared to all public safety agencies across multiple jurisdictions.
- The ability to use digital tools such as digital elevation models can improve information for both disaster preparedness and response in case of a disaster.
- Emergency alert systems enabled over broadband can make it more possible for relatives and concerned citizens to make contact with people in disaster areas.
- IP-registered devices on vehicles can able first responders to immediately become aware of an accident and pinpoint the accident location.
- Broadband-enabled communication with real-time video monitors at dams can provide early alerts to failure possibilities.
- The safety of truck drivers and other highway travelers can be improved through better access to weather and hazard alerts.
- The need for risky highway travel for people living in isolations can be reduced as broadband enables them to access critical functions such as education, health care and job opportunities from home.

Economic Opportunity

The national economic recession impacting the nation and Wisconsin in 2010 has led to significant economic change and a demand for innovation to create new jobs and business opportunities. With better broadband connections, there are new business opportunities for start-up entrepreneurs as well as established businesses to reach new markets, create new products and innovate business processes used to manufacture products and deliver services.

- Nearly all areas of workforce can improve productivity and/or safety on the job through the use of broadband. For example construction workers, linemen, truck drivers and others can use mobile wireless broadband to receive work assignments in the field and get weather alerts.

- The workforce can perform its work task from diverse locations and decrease its work time at the office locations due to improved broadband technologies and associated communication and information technologies. With more people able to work from home:

  - Businesses can reduce costs because there is less need to maintain office space in more expensive urban locations.

  - Workers can avoid the cost and risk of daily commutes to the office.

  - Worker satisfaction can be enhanced with greater flexibility to meet family schedules.

  - Businesses are better able to respond with capacity to meet peak demands.

- Farmers can better research new ideas, reduce costs, access educational content, connect with consumers to improve profitability and competitiveness.

- Rural main street businesses can innovate in small ways such as being able to accept credit cards and in larger ways such as being able to market their products online to customers in distant locations.

- The publishing industry can change from a focus on print publications and the delivery of prepared articles to the application of mobile broadband technologies and social networking. As a result a community of consumers can create rich dynamic content enabling more informed consumer choices for the purchase of services and products.

- With the wider availability of and use of technology, there can be more opportunities for business models that emphasize local production and local sales of products and services. For example, consumers looking for more health food choices can use the Internet to locate and purchase from local organic food producers.

- The Wisconsin tourism industry can accommodate the need for vacationers to have access to the internet to stay in touch with the office and family.

- Native American Tourism can be expanded through web-sites and digital media that enable potential visitors (especially from Asia and Europe) to learn about Wisconsin tribal communities and the opportunity to enjoy the unique culture, natural resources and businesses.

- Wisconsin manufacturing industries can reduce costs through implementing "just-in-time" delivery and improve the precision of production processes through better capability for 24/7 monitoring.

- Businesses of all types can benefit from the ability to use broadband to access rich online training resources from vendors from many locations around the world.

- New specialized business can emerge to help health consumers take charge and manage their own health care by supplying services and technologies that enable people to monitor their own personal health anywhere and share data as needed with health care providers.

- Trucking companies can be more efficient, competitive, safe, and environmentally friendly as mobile broadband is utilized to maximize fleet efficiency, maintain digital logs, implement just-in-time delivery, minimize time at the loading dock, access weather alerts and so forth.

- Broadband connections to the home can be leveraged to start home-based businesses and tap into online degree programs in areas such as nursing. These opportunities can be especially important for rural areas contributing to new income earning opportunities and economic development.

- Progressive dairy and agriculture managers can invest in on-farm camera systems and web-sites enabling consumers to become more educated on where their food comes from by taking virtual real time tours. These same technologies can enable agricultural managers to monitor farm operations from any distance.

- Wisconsin agricultural producers can improve consumer value and distinguish their product in the marketplace with detailed product information (such as impact on carbon foot print, date of production, etc.) through use of broadband and accurate tracking technologies from farm to market.

- Wisconsin dairy farmers can leverage broadband connectivity to reach into new global markets (such as China) emphasizing the state's dairy industry's unique strength in genetics and other product innovations.

- Better broadband access can open up the opportunity for entrepreneurs to pursue a rural lifestyle and "new knowledge" industries in areas that would otherwise not be feasible. Examples include stock-trading, video-production and financial management.

Quality of Life

Wisconsin's rural communities offer advantages such as low crime rate, abundant wildlife, access to nature, natural beauty, lower cost housing and other amenities that are considered desirable by many. Broadband can help smaller towns survive and thrive through access to health care, education, entertainment, job opportunities and other quality of life benefits desired by people interested in participating in a rural life style.

- Costly and time-consuming trips to visit the doctors, to attend school, to shop and so forth can be avoided.

- Broadband can help smaller towns survive, serving to attract businesses to areas with lower costs for housing and facilities. This in turn can help create more local economic opportunity in rural communities and reduce urban sprawl in the larger metropolitan areas.

- With a higher quality of life enabled by broadband, more people are willing to move back to rural communities to start businesses and fulfill workforce needs.

- Quality of Life can be improved for families whose children can realize the benefits of smaller communities such as having access to playing on sports teams at school; this would be unavailable to them in larger schools.

- More young people can be attracted to agriculture and rural communities as access to broadband technology has enabled them to make a good living and obtain the quality of life they desire.

- People can monitor and remotely control appliances and other functions of their homes without needing to be physically present, saving energy, supporting seasonal home ownership and generally improving quality of life.

Resources for Successful Action

Most stakeholders interviewed believe Wisconsin has the potential to successfully expand broadband access, adoption and use to achieve priorities in education, health care, economic opportunity, energy efficiency, environmental quality, government performance, civic participation and public safety as previously outlined. The following are examples of key building blocks for that success identified by several and often many of the stakeholders interviewed.

Leadership

- Wisconsin has more than 29,000 non-profits that have the potential to be strong advocates and partners for broadband development.

- Organized Community Action Networks are recognized as an important means to coordinate leadership from local government, schools, hospitals, businesses and non-profits to advance local broadband development and use.

- Wisconsin can build on its tradition of town hall meetings that provide a forum to advance grassroots input on issues such as broadband development and bring those views to the attention of elected officials.

- Local economic development and business organizations (such as Chambers, tribal economic development organizations, County and Regional Economic Planning organizations, and industry associations are recognized as important organizations and opinion leaders to accomplish change and improvement responsive to local needs.

- Wisconsin education system is viewed favorably as a potential leadership sector that can be a catalyst for change.

- Tribal Councils provide important forums for discussion and avenues for action in policy and decision-making to improve broadband availability and beneficial application.

- The Wisconsin Public Service Commission provides an independent, knowledgeable leadership focus for the advancement of broadband services.

Government

- Many stakeholders interviewed identified Wisconsin's governmental leadership and policy commitment to the development and utilization of alternative energy and energy efficiency as an example of governmental policy priorities that can create support for widely available broadband.

- Federal funding and a policy supports wider adoption of broadband to achieve national purposes in education, health care, economic opportunity, governmental performance, citizen engagement, energy efficiency, environmental quality, public safety and homeland security.

- Federal funding (BTOP, e-rate, USF, RUS, etc.) is available to support innovative broadband infrastructure, public computer access and sustainable adoption projects in Wisconsin.

- Wisconsin's state universal service fund provides financial support for innovative broadband adoption initiatives expanding access for underserved populations.

- Past strategic planning initiatives are a model that can be leveraged for Wisconsin's advancement in the implementation of expanded e-government initiatives.

- Wisconsin state and tribal governments have demonstrated a willingness to use telecommunications to improve efficiency and effectiveness in the delivery of government services.

- As a "home-rule" state, Wisconsin has empowered local institutions of government to have a strong role in leading efforts of change in Wisconsin.

Social and Demographic Trends

- A strong Wisconsin work ethic and a "pull yourself up by the bootstrap" culture provide the foundation for proactive initiatives to expand the availability and use of broadband throughout the state.

- There is recognition that broadband may have a role in helping to preserve important Native American values and culture through use by tribal schools, colleges and medical facilities.

- Wisconsin has the opportunity to apply its history of collaborative community action including the formation of member-managed cooperatives for many purposes (finance, insurance, joint purchasing, electricity, telecommunications, etc.) supporting the needs of rural communities in broadband development strategies.

- The citizens of Wisconsin have an environmental consciousness that can help drive innovative uses of broadband in areas such as energy efficiency and natural resource preservation.

- Wisconsin has a quality of life that has proven attractive to people's desire to stay, return and migrate to Wisconsin when quality employment opportunities adequate to make a living become available. Broadband helps to establish that opportunity.

- A younger generation (born after 1980) is particularly inclined, more than the older generations, to demand and use broadband communications.

- The use of cell phones has become a part of everyday life for many people.

Technology

- New technologies are emerging to mitigate the potential detrimental consequences of expanded reliance on broadband digital information. For example, the protection of privacy and for the security of personal information.

- Readily available digital media publishing software allows individuals and businesses to create new products and communication avenues to reach customers and the general public.

- Advancement in the technology and uses for wireless communications creates new opportunities to fill broadband gaps as well as to extend mobility.

- Information technology, personal digital devices and broadband access are increasingly robust and powerful.

- Technological change has resulted in a lowering of the cost of computers and broadband charges, making access both more universal and affordable.

- Technology continues to become easier to use.

Emerging Economy

- Growing bio-tech, health care, green energy, agriculture and forest products clusters provide a foundation for economic revival in Wisconsin. Wisconsin also has a strong manufacturing sector that has transitioned to high tech applications.

- Wisconsin offers a quality of life and community environment that is considered desirable and is attractive to the workforce that is needed in the emerging information economy.

- Entrepreneurial businesses create new information technology devices and software, broadband services and bundled technology services to meet consumer needs and demands.

- With more available broadband, people are better able to start new businesses in rural communities as well as to work from home, helping to support the local economy in those areas.

- Wisconsin has a progressive business community serving global customers through use of broadband connections.

- Wisconsin has a significant workforce that is well prepared with the analytical and performance skills required by companies to be successful in a globally competitive economy.

- There exist strong collaboration among Wisconsin's "angel" networks evidenced by a searchable database that connects entrepreneurs and investors.

- Wisconsin has the potential to be a leader in "next generation" bio-fuels, wind and fresh water technologies, all of which can benefit from broadband.

- Wisconsin leads the nation in the number of certified organic farmers and broadband provides an opportunity to support the marketing and development of this important sector.

Educational Networks

- The University of Wisconsin system garners nearly $1 billion a year in research and development grants and is in the top three for research universities in the world.

- There is a close relationship between industry and technical colleges.

- Schools universities, technical colleges and non-profits, separately and in partnership, provide important outreach and education in preparing students and the workforce to be successful with emerging technologies.

- Wisconsin's K-12 system, is consistently is ranked high in the nation, based on SAT and ACT scores, year after year.

- Wisconsin Virtual Schools allow access to more educational options for K-12 schools, as well as home school families.

- Wisconsin's educational system turns out a high number of well prepared professionals with math, science, and thinking skills required by bio-technology and other leading edge information businesses.

- Higher education institutions, including the University of Wisconsin Extension Service, provide credible knowledge and information to support local engagement in all 72 counties.

Possible Actions Identified by Stakeholders

The 28 stakeholders were asked to speak to the overall goals of promoting wider availability and access to broadband as well as to achieving the expanded adoption and use of broadband to achieve state priorities. The following are examples of actions identified by several and in many cases multiple stakeholders who were interviewed.

Broadband Service Gaps

- State officials, community and tribal leadership organizations could help focus public initiatives and private investment by assembling factual data on current gaps in broadband service as well as on the potential impact on goals such as job creation and business development. With better data both the business case for private investment and the rationale for additional public investment can be better understood.

- Coordination is important to leverage the joint resources of WiscNet and BadgerNet to maximize the opportunity to provide connectivity to schools and other public institutions.

- An expansion of broadband connections to schools, hospitals, government facilities, public safety communication towers, and so forth, could be leveraged as a shared infrastructure that is also available to local broadband service providers who are responsible for extending broadband to community residents and businesses.

- Public and private partnerships could be encouraged where beneficial to accomplish expanded broadband penetration using mixed models of service delivery.

- The rules for administering broadband loans could be reviewed to ensure program provisions adequately incent loan recipients to reinvest capital for continued broadband development.

- Wisconsin state officials and tribal councils could encourage broadband service providers to apply for and utilize available federal funding for broadband infrastructure build-outs.

- Regulatory reforms and incentives could be considered to encourage the wireless broadband industry to continue to evolve to a level where seamless connectivity is available throughout Wisconsin.

- Wisconsin state government leadership could take a proactive role in mandating a minimum data speed capability standard, available throughout the state.

- The Wisconsin legislature could consider changes that allow cooperatives to reinvest profits into broadband telecommunications infrastructure.

- Wisconsin state officials and tribal councils, in consultation with telecommunication providers, community organizations and others, could advocate to the Federal Government to free up unused spectrum for public use in deployment of more wireless broadband access to underserved and unserved areas.

- Wisconsin higher education could expand community engagement initiatives to help leadership in all 72 counties better understand available and possible options (documenting demand, forming community area networks, etc.) to attract investment needed to fill broadband service gaps.

Improve Adoption and Use

- Wisconsin state officials could establish a special commission, including public, private, and non-profit entities, to create public awareness of broadband technology benefits. Funding for this commission could be achieved through expanding the state's current universal service fund.

- Faith-based, non-profits and community organizations could partner with business and government to teach other community members the skills needed to take advantage of computers and broadband connections.

- Wisconsin's telecommunications providers could provide grants and employee volunteer incentives to deliver technology literacy education and to facilitate more public access computing locations in the communities they serve.

- Wisconsin state officials could consider appropriate legislation and regulatory changes as may be needed to enable fair and appropriate competition among broadband service providers as a means to help control prices and make broadband access more affordable.

- Public libraries, churches and other community-based organizations throughout the state could develop partnerships to build computer and technology labs, providing additional public access opportunities to underserved communities.

- Wisconsin's local non-profits could expand partnerships with schools and government to deliver technology awareness and literacy training to youth, seniors and others with limited adoption experience.

- Wisconsin state officials could coordinate with the federal government to ensure appropriate protections are in place to help mitigate the growing challenges of protecting private information stored online.

Wisconsin Priorities

In addition to these overarching recommendations, the 28 stakeholders interviewed also identified specific actions to expand adoption and use of broadband to achieve specific state priorities.

Education

- Wisconsin's state, local and tribal education leadership could consider appropriate restructuring of education to include greater integration of online and face-to-face education.

- The federal e-rate program and the state universal service fund could be leveraged to get more funding to support broadband expansion and upgrades to school districts.

- State, local and tribal leaders could direct more resources to in-service training to better prepare teachers to use online tools for teaching and learning.

- School districts could pursue grants and local levies to expand computer equipment, video conferencing capability and training for teachers.

- State policy leaders could consider uncapping student enrollment requirements, where appropriate, to expand the incentive to use distance education to deliver desired courses to all locations in Wisconsin.

- Wisconsin could potentially free-up more funds to invest in distance education through reforms, such as consolidating administrative functions and implementing fair school finance network tax reforms.

Health Care

- Wisconsin policy leaders could consider amending BadgerNet authority to include connections to public hospitals.

- State health care leadership could actively engage in federal and state forums to develop both new technological tools and policy reforms that will ensure the confidentiality of patient data stored online.

- On-going education and advocacy could be utilized to ensure the state's health care industry is aware of and able to successfully apply for relevant federal funding programs.

- Proactive initiatives that encourage the public, private and non-profit delivery of online information content could include education to the general public on how to better manage their personal health.

Energy and Environment

- State, local and tribal government planners could include assessment of how expanded access to broadband and information will impact land-use patterns in environmentally-sensitive areas as a standard component of state, regional and local planning processes.

- State policies could consider appropriate actions to ensure that companies that produce disposable technology products and devices adopt processes that minimize environmental impact.

- Wisconsin state and tribal government leaders could consider opportunities to leverage broadband to accomplish goals in energy efficiency and sustainable resource management.

- Wisconsin energy utilities and other business interests could take a proactive role in educating consumers regarding opportunities to save money through the utilization of new smart-metering, real-time pricing and related technologies.

- Wisconsin could leverage federal stimulus dollars available to expand deployment of smart-grid and broadband enabled energy efficiency measures.

Government Performance and Citizen Engagement

- Local, state and tribal governmental entities could adopt broadband to support regional collaboration and gain efficiencies through reduced duplication in the provision of governmental services.

- Wisconsin state officials could expand access to governmental information through the use of information kiosks and other computer access facilities available to the public.

- Wisconsin state government could expand broadband access to all state facilities, as well as equipping all state employees with necessary technologies and skills required to efficiently conduct government business online.

- State officials could use broadband and information technology to improve government performance in supporting efficient transportation. For example, the adoption of digital logs, smart-toll systems, weigh-in-motion and so forth.

Public Safety

- Available federal funding could be considered to build-out broadband connectivity to public safety facilities such as fire, city hall, hospitals, communication towers and dispatch centers.

- Extending fiber to communication towers could be considered as a means to increase emergency preparedness and response communications capability to mobile units.

- Wisconsin public safety leadership could establish format and platform standards to ensure all forms of emergency data are sharable and retrievable across multiple jurisdictions.

- Regulatory changes that allow the portioning of broadband designated for public safety to also be used for private purposes could be considered to improve the cost effectiveness of broadband deployment to rural areas. This should be subject to agreement on appropriate standards protecting the integrity of the public safety communications network.

- State emergency management leadership could apply for federal grants to fund training programs for local government officials and first responders in local areas making them more aware and capable of using emergency alert systems.

Economic Opportunities

- Wisconsin business leadership could take on broadband as an issue of focused advocacy recognizing the importance of broadband access to keep Wisconsin in a competitive leadership position.

- Wisconsin public and private leadership could consider implementation of business-friendly policy reforms directed to reducing health care costs, reducing high tax rates and other special incentives as needed to encourage private investment and innovation, including the wider business use of broadband.

- New legislation could be considered to help start-up businesses become more viable, including new programs that provide financial capital for expansion and incentives for reinvestment.

- Targeted initiatives to expand Wisconsin's technical college and private company training investments could be directed to strengthen information sector workforce skills.

- The Native American Tourism of Wisconsin could expand resources directed to the creation of websites and digital media to create expanded awareness of Wisconsin Tribes cultural assets available to visitors.

Conclusion

This report briefly summarizes the perspectives of a diverse group of Wisconsin stakeholders regarding what is possible and desired within plans to expand broadband access and utilization throughout Wisconsin. These results are not intended to be conclusive or reflect consensus. Rather these perspectives will help frame on-going discussions at the local level and facilitate the development of specific regional plans to reduce barriers to broadband access and improve utilization to strengthen Wisconsin's economic competitiveness and improve the quality of life for all citizens.

Appendix A: Wisconsin Data and Development Grant Program Summary

Wisconsin Governor Jim Doyle designated the Public Service Commission of Wisconsin (PSCW) as the Wisconsin entity eligible to receive a federal mapping grant under the National Telecommunications and Information Administration's (NTIA) State Broadband Data and Development Grant Program. In August 2009, the PSC submitted a grant application to the NTIA seeking funding for broadband mapping activities for five years. This was later modified per NTIA request to address only the first two years of this program. The PSC has contracted with the LinkAMERICA Alliance to assist the state with the mapping and planning activities. The PSC and LinkAMERICA will work together to conduct broadband mapping and to develop a long-term, sustainable plan for increasing access to and use of broadband.

Budget Summary:
The two-year budget totaled $1,717,684, which includes $1,232,328 for mapping and $485,356 for broadband planning purposes. The NTIA requires a 20-percent matching of funds by the state. Wisconsin's non-federal matching commitment, valued at more than $343,536, will be met through in-kind contributions that include existing hardware and software used to undertake broadband mapping efforts at the PSC, existing personnel positions staffed by highly-skilled GIS and policy experts, and other contributions in the form of broadband maps previously created and data previously collected.

Mapping Summary:
The mapping portion of the project will produce statewide accurate and verifiable data and maps of broadband availability according to the technical specifications and timelines set forth by the NTIA. The data and maps will, among other things, identify unserved and underserved areas within Wisconsin at a granular level; and be accessible online to customers, providers and policymakers, yet will protect provider confidential information through the use of non-disclosure agreements (Naas) and other security measures.

This work will build on and expand upon previous work of the PSC to collect, analyze and publish supply- and demand-side broadband availability and adoption data and maps for Wisconsin.

Planning Summary:
The planning portion of the project will, through a collaborative process, conduct and implement a comprehensive broadband planning and demand-side assessment. The process will include these tasks:

- Implement a broadband **situational assessment** for Wisconsin.

- Conduct qualitative and quantitative research to **assess current and future broadband uses and barriers** to adoption.

- **Map broadband demand scenarios** that advance Wisconsin's priorities in distance learning, economic development, e-government and telehealth.

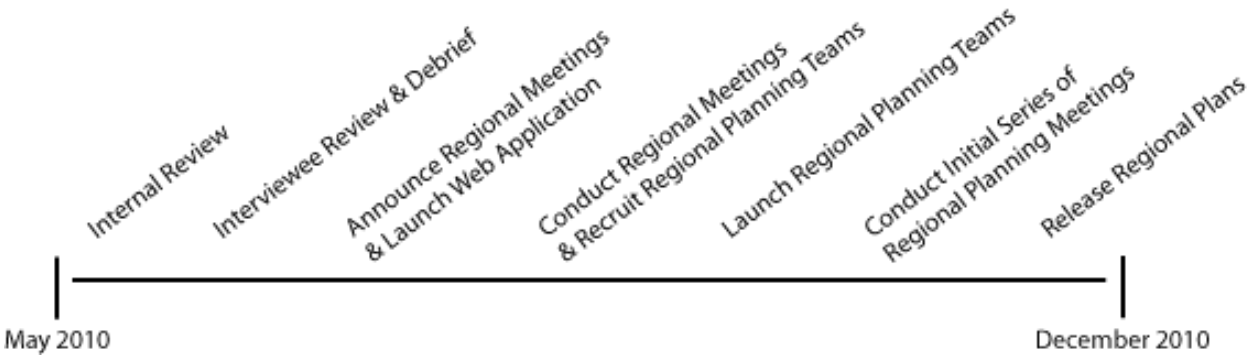
- Facilitate **regional technology planning teams** to develop relevant local action strategies, including expanding computer ownership and Internet access programs funded by NTIA.

These tasks will fulfill the requirements of the broadband planning portion of this grant program and help the PSC and the state realize the benefits of broadband more widely dispersed in the state.

Appendix B: Overview of the Planning Process

The Planning Process is designed to develop a framework of regional plans for broadband development that are:

- Well supported and endorsed by local champions.
- Responsive to specific regional priorities.
- Doable within a defined period of time,.
- Economically rationale.
- Measurable.



The completion of this report signals the start of the planning process.

Internal Review – In early June 2010, this report will be reviewed by the LinkAMERICA Team and lead Wisconsin Public Service Commission staff. The report may be edited during this review.

Interviewee Review & Debrief – By mid-June, this report will be reviewed with the interviewees, culminating in a debriefing where specific feedback is collected and edits are considered. This report will likely change as a result of this review.

Announce Regional Meetings & Launch Web App – Once changes to the report are stabilized, an interactive web application designed to present the major points of this report will be created; this web application will also collect feedback data from viewers. This web application will be launched as part of the announcement of a series of regional meetings during which the report is presented through a facilitated work session. Target date for the announcement and launch is late June.

Conduct Regional Meetings & Recruit Regional Planning Teams – Convened mid-July and through September, the purpose of these regional meetings will be to raise awareness about this broadband development project, get feedback on priorities and recruit members for regional planning teams.

Launch Regional Planning Teams – These regional planning teams will be launched in late-September.

Conduct Initial Series of Regional Planning Meetings – Each Regional Team will meet at least three times during the Fourth Quarter of 2010 with the goal of producing an initial draft of a regional broadband development plan.

Release Regional Plans – By mid-December, each regional planning team will release an initial draft of their broadband development plan. During the first half of 2011, these plans will be further developed into fundable and actionable business plans.

Appendix C: What is Broadband?

Broadband is an always-on, high-speed connection to the Internet. Broadband makes it possible to have instant two-way exchange of data, video, audio, voice and text communications. Broadband is delivered to consumers in a number of ways, including over telephone lines, cable, fixed wireless, mobile wireless, over power lines and by satellite. The LinkWISCONSIN initiative will map the availability of broadband across the state.

All Internet services identified on the maps will meet the minimum Federal Communications Commission (FCC) definition for broadband service – 768 Kbps download speed. A number of engineering and usage variables impact the actual speeds required for applications, such as photo sharing, streaming audio/video, online gaming, distance education, telework, telehealth and other bandwidth intensive applications. However, the following provide general guidelines for broadband speed tiers and capabilities that are enabled within each tier:

- 768 Kbps – 1.5 Mbps: generally considered sufficient for basic internet applications including email, light web surfing, sharing of lower resolution pictures, etc. The FCC definition of broadband 'starts at' 768 Kbps. Speeds below this level are not considered broadband in today's marketplace.

- 1.5 Mbps – 3.0 Mbps: generally considered a quality broadband service speed range. Enables a more robust web surfing experience (few noticeable delays), the sharing of larger files (in a timely fashion), and reasonable quality Internet Protocol Television (IPTV) and streaming audio/video.

- 3.0 Mbps – 6.0 Mbps: generally considered a strong broadband service speed range in today's market. May only be available via technologies such as cable, fiber and the latest generation wireless services. Typically sufficient for good quality two-way video streaming and IPTV, large file transfers (in a timely manner), a high-quality web surfing experience, and online gaming.

- 6.0 Mbps – 10.0 Mbps: considered a very strong/fast service speed in today's market. Enables commercial grade file transmission, a very robust web surfing experience, high-quality video/audio streaming for education and telehealth applications, and robust online gaming.

- 10.0 Mbps – 25.0 Mbps: a very high-end consumer or commercial grade service in today's broadband market. Provides for very high-quality (high-definition) streaming audio/video experience, very fast file transfer capability, multi-player gaming and other high bandwidth applications.

Appendix D: Wisconsin Broadband Telecommunications Providers

24-7 Telcom (Part of Western WI Telecom Coop)	Clear Lake Telephone Company dba CLT Communications
360 Networks Inc.	Clearwire Corporation
Amery Telecom, Inc.	Cochrane Cooperative Telephone Co.
Amherst Telephone Company	Comcast Cable Communications, Inc.
AT&T Inc dba AT&T Services Inc.	Community Antenna system
AT&T Inc dba New Cingular Wireless Services	Coon Valley Farmers Telephone Company, Inc.
AT&T Inc. dba AT&T Corporation	Covad Communications Company (DIECA Communications)
Baldwin Broadband LLC	Cuba City Telephone Exchange Co (part of LaGrant Connections)
Baldwin Telecom, Inc.	DiMan Systems dba Internet Kmoraine
Bayland Communications	DSL.net, Inc. (Megapath)
Belmont Telephone Company (Part of LaGrant Connections)	E-Vergent.com, LLC
Bergen Telephone Company	Farmers Independent Telephone Company dba Grantsburg Telecom
Bloomer Telephone Company	Frontier Communications of Viroqua
Broadview Networks Holdings, Inc.	Frontier Communications Corp.
Brown Telephone	Frontier Communications dba - Rhinelander Telephone Company
Bruce Telephone Company, Inc.	Frontier Communications of Mondovi
CCI SYSTEMS, INC. dba Pakcard Broadband	Frontier Communications- St Croix, Inc
Central Wisconsin Communications, LLC dba Solarus	Geneva On-Line, Inc.
CenturyTel, Inc.	Hager TeleCom, Inc. (Part of Hector Comm. Corp)
Charter Communications	Hillsboro Telephone Company, Inc.
Cheqtel Communications Company, Inc. (part of Chequamegon Comm. Coop)	Indianhead Telephone Company (Part of Hector Comm. Corp)
Chequamegon Communications Cooperative, Inc.	International Broadband Electric Communications, Inc.
Chibardun Telephone Cooperative, Inc.	LaGrant Connections
Chibardun Telephone Cooperative, Inc. dba CTC Telecom	Lakefield Communications, Inc.
Choicetel LLC	Lakefield Telephone Company
Citizens Telephone Cooperative, Inc.	Lakeland Communications dba 'Lakeland Telecom, Inc.
LaValle Telephone Cooperative, Inc.	Reedsburg Utility Commission
Leap Wireless dba Cricket	Richland-Grant Telephone

Communications	Cooperative, Inc.
Lemonweir Valley Telephone Company	Sharon Telephone Company (CLEC)
Level 3 Communications dba 'Broadwing Communications, LLC	Sharon Telephone Company (ILEC)
Level 3 Communications dba 'WilTel Communications, LLC.	Siren Telephone Company, Inc.
Level 3 Communications, LLC	SonicNET
LiteWire Internet Services, Inc.	Spring Valley Telephone Co. dba 'Celect Communications, LLC
Manawa Telecommunications, Inc.	Spring Valley Telephone Company, Inc.
Marquette-Adams Telephone Cooperative, Inc.	Sprint Nextel Corporation
Mediacom Communications Corp.	T6 Wireless, Inc.
Mercury Network Corporation	TDS Telecommunications
Merrimac Communications, Ltd.	Tech-Com, Inc.
MH Telecom, LLC (part of Mount Horeb Tel.)	Time Warner Cable LLC
Midwest Fiber Networks	Tri-County Communications Cooperative, Inc.
Mosinee Telephone Company (part of TDS)	TW Telecom Inc.
Mount Horeb Telephone Company	Union Telephone Company
Nelson Telephone Cooperative	United States Cellular Corp. (part of TDS)
Nelson Telephone Cooperative dba 'Chippewa Valley cable Inc.	US Signal Company LLC
New Edge Holding Company	Verizon da Cellco Partnership (wireless)
NEWIS	Vernon Communications LLC
Nextera Holding, LLC	Waupacu, City of
Niagara Community TV Coop.	West Wisconsin Telcom Cooperative, Inc.
Niagara Telephone Company	Western Wisconsin Communications, LLC
Northeast Communications of Wisconsin, Inc. dba 'Net Lec, LLC	Wittenberg Telephone Company
PaeTec Corp dba 'McLeodUSA Telecommunications Services, Inc.	Wood County Telephone Company
Price County Telephone Company	
Price County Telephone Company dba 'Price County Information Systems, Inc.	Zayo Group, LLC

Appendix E: Recent Broadband Grants Benefiting Wisconsin

The Board of Regents of the University of Wisconsin System

Infrastructure Grant: $5,106,373

The Metropolitan Unified Fiber Network project plans to deploy more than 100 miles of fiber-optic middle mile infrastructure to provide high-capacity broadband Internet connections for underserved community anchor institutions, and enable last-mile broadband services throughout the Madison, Middleton, and Monona, Wisconsin region. The project expects to directly connect nearly 100 community anchor institutions, including schools, public safety organizations, and a community college, at speeds of up to 10 Gbps. The project also expects to spur new or improved broadband Internet access for local residents and businesses, including as many as 47,000 households and 5,000 businesses, by enabling last mile service providers to connect to the project's open network.

State of Wisconsin Department of Administration

Infrastructure Grant: $22,978,367

Wisconsin's Education and Library Broadband Infrastructure Buildout project proposes to directly connect 385 libraries, 74 school districts, and eight community colleges (including two tribal colleges) to the existing high-speed BadgerNet Converged Network by deploying 203 miles of new fiber-optic facilities to replace inadequate copper infrastructure in predominantly rural areas. The BadgerNet Converged Network is the largest state network of its kind in the United States and currently provides connectivity to more than 2,300 state and local government agencies, schools, libraries, and healthcare facilities. The additional fiber connections are expected to upgrade 17 percent of the state's schools and 81 percent of the state's libraries to broadband speeds of between 20 Mbps and 100 Mbps, strengthening their ability to serve underserved communities throughout the state.

One Economy Corporation

Sustainable Broadband Adoption: $28,519,482
Project serves Alabama, Arkansas, California, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Kentucky, Massachusetts, Maryland, Michigan, Minnesota, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Virginia, Washington, and ***Wisconsin****.*

The 21st Century Information and Support Ecosystem project proposes to implement a comprehensive program of computer training, wireless Internet access, broadband awareness marketing, and online content and applications to residents of 159 affordable and public housing developments and low-income communities in 50 cities and towns across 31 states and the District of Columbia. The project plans to implement four principal programs: training 2,500 youth to become "Digital Connectors" who will then provide

digital literacy training to others in their communities; deploying localized broadband networks in public housing developments; developing online content and applications aimed at low-income, low-literacy audiences

Appendix F: Partial List of Interviewees

Twenty-eight individuals representing a wide cross-section of Wisconsin stakeholders were interviewed in the development of this document. To ensure rich responses, the identity of interviewees is held in confidence. However, the following list of individuals agreed to publish their name with this report to illustrate the wide diversity of people interviewed. The content of this report is based on input from the interviewees solely from their perspective as individuals who live and work in Wisconsin. Nothing in this document should be interpreted to represent opinions or positions of the organizations or agencies where the interviewees are employed.

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Marshfield Clinic

Bob Bocher
Technology Consultant
Wisconsin Department of Public Instruction

Jeffrey W. Collins
COO
SonicNet Inc.

Bob Egan
Chairman
Vilas County Economic Development Committee

Gary A. Evenson
Administrator
Telecommunications Division
Public Service Commission of Wisconsin

Julietta Henry, Director
Governor's Office of Community and Faith Based Partnerships

Eric Howland
Executive Director DANEnet

Thomas S. Ivey, Jr.
UniServ Director
Central Wisconsin UniServ Council

Professor Andrew Lewis
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Center for Community and Economic Development
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Nicholas A. Linden
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Bruce Reines
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Roecker's Rolling Acres, LLC

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Director, Educational Technology Services
CESA 10